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REMARKS

By the present amendment and response, independent claims 1 and 11 have been amended to overcome the Examiner's objections. Claims 5-10 and 17-20 have been withdrawn from consideration by the Examiner, pending future examination and allowance. Reconsideration and allowance of the claims presently considered by the Examiner, i.e. claims 1, 3-4, and 11-16, in view of the following remarks are requested.

The Examiner has rejected claims 1, 3-4, and 11-16 under 35 USC §103(a) as being unpatentable over U.S. patent number 6,114,962 to Wiklof et al. ("Wiklof") in view of U.S. patent number 6,246,327 B1 to Noel H. Eberhardt ("Eberhardt"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 1 and 11, is patentably distinguishable over Wiklof and Eberhardt, singly or in combination.

The present invention, as defined by amended independent claim 1, teaches, among other things, an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." As disclosed in the present application, by utilizing a trace on the top surface of the laminate substrate to couple the antenna element to the laminate substrate bond pad, the present invention advantageously achieves flexibility in choosing the location of the antenna element on the

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top surface of the laminate substrate while maintaining a desirably short bonding wire length. As further disclosed in the present invention, the bottom surface of the laminate substrate can comprise, for example, laminate substrate ball pads or lands. Thus, the present invention advantageously provides a semiconductor die, an antenna element, a trace, and a laminate substrate bond pad situated on a top surface of a laminate substrate, where the laminate substrate has a bottom surface that can be electrically connected to a printed circuit board.

In contrast to the present invention as defined by amended independent claim 1, Wiklof does not teach, disclose, or suggest an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." Wiklof specifically discloses RF tag 5 including integrated circuit 26, which is mounted in recess 24 in first surface 12 of substrate 10. See, for example, column 4, lines 16-17 and 47-50, and Figure 3 of Wiklof. In Wiklof, antenna 28 is formed on first surface 12 of substrate 10 and includes bonding pad 29, which is formed at the end of antenna 28 and is coupled to integrated circuit 26 by bonding wire 30. See, for example, column 4, lines 64-67, column 5, lines 7-11, and Figure 2 of Wiklof. However, Wiklof fails to teach, disclose, or suggest an antenna element coupled to laminate substrate bond

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pad by a trace. In fact, by forming a bonding pad on the end of an antenna, Wiklof teaches away from connecting the bonding pad to the antenna by a trace.

Additionally, in Wiklof, integrated circuit 26 is mounted in recess 24 in first surface 12 of substrate 10, while antenna 28 is formed on first surface 12. Thus, in Wiklof, integrated circuit 26 and antenna 28 are not situated on a top surface of a laminate substrate, as specified by amended independent claim 1. Furthermore, Wiklof fails to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board. In fact, in Wiklof, substrate 10 is suitable for being received in smart label 22, which comprises face sheet 32, adhesive layer 38, and release liner 40. See, for example, column 4, lines 42-52 and Figure 10 of Wiklof. Thus, Wiklof teaches away from providing a substrate having a bottom surface that can be electrically connected to a printed circuit board.

In contrast to the present invention as defined by amended independent claim 1, Eberhardt does not teach, disclose, or suggest an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." Eberhardt specifically discloses radio frequency ("RF") identification tag 100, which includes antenna 32 situated on surface 32 of substrate 30. See, for example, column 4, lines 34-36 and Figure 4 of Eberhardt. In Eberhardt, antenna 32 includes first

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antenna element 36 including first coupling region 38 and second antenna element 40 including second coupling region 42. See, for example, column 4, lines 37-39 and Figure 4 of Eberhardt.

However, Eberhardt fails to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board, as specified in amended independent claim 1. Furthermore, Eberhardt teaches an RF identification tag that is designed as a single use, disposable device, which can be attached to and remain with an item to be tracked via electronic article surveillance technology. See, for example, Eberhardt, column 2, lines 42-50. Thus, Eberhardt teaches away from providing a substrate having a bottom surface that can be electrically connected to a printed circuit board. Thus, Eberhardt fails to cure the deficiencies to Wiklof discussed above.

For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Wiklof and Eberhardt, singly or in combination. Thus amended independent claim 1 is patentably distinguishable over Wiklof and Eberhardt and, as such, claims 3 and 4 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Wiklof and Eberhardt for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The present invention, as defined by amended independent claim 11, teaches, among other things, first and second semiconductor dies and first and second antenna

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elements attached to a top surface of a laminate substrate, where a first bonding wire provides an electrical connection between a first substrate bond pad and a semiconductor die bond pad on the first semiconductor die and a second bonding wire provides an electrical connection between a second substrate bond pad and a semiconductor die bond pad on the second semiconductor die, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." The present invention as defined by amended independent claim 11 provides similar advantages as the present invention as defined by amended independent claim 1 discussed above.

In contrast, Wiklof and Eberhardt fail to teach, disclose, or suggest a laminate substrate comprising first and second semiconductor dies electrically connected to respective first and second antenna elements situated on a top surface of the laminate substrate. Furthermore, as discussed above, Wiklof and Eberhardt fail to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board.

Thus, Applicant respectfully submits that the present invention, as defined by amended independent claim 11, is not suggested, disclosed, or taught by Wiklof and Eberhardt, singly or in combination. Thus, amended independent claim 11 is patentably distinguishable over Wiklof and Eberhardt and, as such, claims 12-16 depending from amended independent claim 11 are, *a fortiori*, also patentably distinguishable over Wiklof

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and Eberhardt for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 1, 3-4, and 11-16 under 35 USC §103(a) as being unpatentable over U.S. patent number 6,534,711 B1 to Richard Stephen Pollack ("Pollack") in view of Eberhardt. For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 1 and 11, is patentably distinguishable over Pollack and Eberhardt, singly or in combination.

In contrast to the present invention as defined by amended independent claim 1, Pollack does not teach, disclose, or suggest an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." Pollack specifically discloses PCB ("printed circuit board") 720 situated on inner surface 706a of base portion 706 of encapsulation package 704. See, for example, column 19, lines 60-67, column 20, lines 1-12, and Figure 7A of Pollack. In Pollack, pad 726 on the surface of PCB 720 is coupled to antenna 750 by bond wire 732 and leadframe finger 730f, which is situated on inner surface 706a of base portion 706. See, for example, column 20, lines 5-17, column 21, lines 1-20, and Figure 7D of Pollack. In Pollack, integrated circuit 728 is situated on PCB 720. See, for example, column 20, lines 5-12 and Figure 7D of Pollack.

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Thus, in Pollack, since integrated circuit 728 is situated on PCB 720 and antenna 750 is mounted on inner surface 706a of base portion 706, integrated circuit 728 and antenna 750 are not situated on the top surface of the same laminate substrate, as required by amended independent claim 11. In Pollack, pad 726 on the surface of PCB 720 is coupled to antenna 750 by bond wire 732. However, Pollack fails to teach, disclose, or suggest a laminate substrate bond pad coupled to a semiconductor die bond pad by a bonding wire. In fact, Pollack fails to teach, disclose, or suggest a semiconductor die bond pad or a bonding wire situated on a semiconductor die.

Additionally, Pollack fails to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board. Moreover, in Pollack, encapsulation assembly 1000, which can include any one of various encapsulation package assemblies disclosed in Pollack, can be sandwiched between two rubber sheets, which are sealed around their edges, and mounted to an inside surface of a pneumatic tire. See, for example, column 25, lines 60-67, column 26, lines 1-4, and Figure 10A of Pollack. Thus, Pollack teaches away from providing a substrate having a bottom surface that can be electrically connected to a printed circuit board.

As discussed above, Eberhardt fails to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board, as specified in amended independent claim 1. Thus, Eberhardt fails to cure the deficiencies of Pollack discussed above.

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For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Pollack and Eberhardt, singly or in combination. Thus amended independent claim 1 is patentably distinguishable over Pollack and Eberhardt and, as such, claims 3 and 4 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Pollack and Eberhardt for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The present invention, as defined by amended independent claim 11, teaches, among other things, first and second semiconductor dies and first and second antenna elements attached to a top surface of a laminate substrate, where a first bonding wire provides an electrical connection between a first substrate bond pad and a semiconductor die bond pad on the first semiconductor die and a second bonding wire provides an electrical connection between a second substrate bond pad and a semiconductor die bond pad on the second semiconductor die, and where "a bottom surface of said laminate substrate is suitable for being electrically connected to a printed circuit board." The present invention as defined by amended independent claim 11 provides similar advantages as the present invention as defined by amended independent claim 1 discussed above.

In contrast to the present invention as defined by amended independent claim 11, Pollack and Eberhardt fail to teach, disclose, or suggest a laminate substrate comprising first and second semiconductor dies electrically connected to respective first and second

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antenna elements situated on a top surface of the laminate substrate. Furthermore, as discussed above, Pollack and Eberhardt fail to teach, disclose, or suggest a laminate substrate having a bottom surface that is suitable for being electrically connected to a printed circuit board.

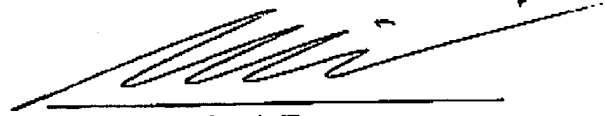
Thus, for similar reasons as discussed above, Applicant respectfully submits that the present invention, as defined by amended independent claim 11, is not suggested, disclosed, or taught by Pollack and Eberhardt, singly or in combination. Thus, amended independent claim 11 is patentably distinguishable over Pollack and Eberhardt and, as such, claims 12-16 depending from amended independent claim 11 are, *a fortiori*, also patentably distinguishable over Pollack and Eberhardt for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1 and 11 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1, 3-4, and 11-16, presently considered by the Examiner, are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 1, 3-4, and 11-16 is respectfully requested.

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Respectfully Submitted,
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